00162072

DATA EVALUATION RECORD

1. Chemical: CN-11-4962
diglycolamine salt of dicamba
(2-methoxy-3,6-dichlorobenzoic acid)

2. Test Material: Formulated Product
40% dicamba

3. Study Type: Avian Dietary LC_{50}

Species Tested: Anas platyrhynchos

4. Study ID: Grimes, J.L. et al. (1986) CN-11-4962 4 lb/gal diglycolamine salt of dicamba: a dietary LC_{50} study with the mallard. Prepared by Wildlife International, Ltd. Project No. 107-226. EPA Accession No. ~~263863~~. 00162072

5. Reviewed By: Thomas M. Armitage
Fisheries Biologist
EEB/HED
Signature: Thomas M. Armitage
Date: 9-17-86

6. Approved By: Raymond W. Matheny
Supervisory Biologist
EEB/HED
Signature: Raymond W. Matheny
Date: 9-17-86

7. Conclusion:

The study was conducted according to accepted protocol. With a dietary LC_{50} > 2248 ppm, the diglycolamine salt of dicamba may be slightly toxic to mallard ducks on a subacute dietary basis. The no-observed effect concentration was 2248 ppm.

The study fulfills the Guidelines requirement for an avian dietary LC_{50} determination.

8. Recommendation: N/A.

9. Background:

The study, an avian dietary LC_{50} determination for mallard ducks using the diglycolamine salt of dicamba, was submitted to fulfill testing requirements for full registration of the herbicide.

10. Discussion of Individual Test: N/A.

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11. Materials and Methods:
(Definitive Test)

a. Test Animals:
(excerpted from submission)

All mallards were 10 days of age and appeared to be in good health at initiation of the study. The birds were obtained from Whistling Wings Box 1, 113 Washington Street, Hanover, Illinois 61041. The birds were hatched on January 13, 1986 and received at Wildlife International Ltd. on January 15, 1986. All birds were pen-reared and phenotypically indistinguishable from wild birds. Birds were assigned to five test groups and five control groups. Each treatment or control group contained ten ducklings. The ducklings were too immature to differentiate by sex. All birds were acclimated to the caging and facilities from the day of receipt until initiation of the study.

b. Dose:

Animal Diet

Throughout acclimation and testing all test birds were fed a game bird ration formulated to Wildlife International Ltd.'s specifications (see Addendum I). Water from a 400 foot well on the Wildlife International Ltd. site and feed were provided ad libitum during acclimation and during the test. The birds received no form of antibiotic medication during the acclimation or the study.

Diet Preparation

The test diets were prepared by mixing the test substance into the diet with corn oil. The concentration of corn oil in the treated and control diets was 2%. Mixing of the test diet was done with a Hobart (Model Number AS200T) mixer. Diets were prepared on the day of study initiation. An amount of diet sufficient to last the five day exposure period was presented to the

birds at initiation of the study. The dietary concentrations were not adjusted for purity of the test substance. Therefore all dietary concentrations and the LC_{50} value are reported as parts per million of the test substance as received. Nominal dietary test concentrations used in this study were 562, 1000, 1780, 3160, and 5620 ppm.

c. Design:

Groups of ten mallard ducklings were assigned to each of the treatment and control groups by random draw. The birds used in this study were too immature to differentiate by sex. Birds were acclimated from the day they were received until test initiation. The test consisted of a geometric series of five test concentrations and five control groups. Nominal dietary concentrations used in this study were 562, 1000, 1780, 3160, and 5620 parts per million (ppm). The dietary concentrations were established based upon known toxicity data. Each group was fed the appropriate test or control diet for five days. During the exposure period the control group received an amount of the carrier in their diet equivalent to the greatest amount used in the treated diets. Following the five day exposure period all groups were given untreated feed for three days.

Duration of the Study

The primary phases of this study and their durations were:

1. Acclimation - 8 days.

2. Exposure - 5 days.

3. Post-exposure observation - 3 days.

Housing and Environmental Conditions

During acclimation and testing, all birds were housed indoors by test group in batteries of brooding pens manufactured

by Beacon Steel Products Co. (Model No. B735). Birds were assigned to pens by random draw. Each pen had floor space that measured approximately 72 x 90 cm. Ceiling height was approximately 24 cm. External walls, ceilings and floors were constructed of galvanized steel wire and sheeting. Each test or control group was assigned a pen that contained ten ducklings. Each group of birds was identified by pen number. Average ambient room temperature for this study was 69° ± 2°F (SD) with a relative humidity of 67%. The photoperiod (maintained by a time clock) was seventeen hours of light per day during acclimation and throughout the study. The light source was Chroma 50 fluorescent lights which closely approximate noon-day sunlight (noon-day sun - 4870° Kelvin, Chroma 50 - 5000° Kelvin). The birds received approximately twelve footcandles of illumination.

Housing and husbandry practices were based upon the "Guide for the Care and Use of Laboratory Animals," 1978 DHEW Publications No. (NIH) 78-23.

Observations

During acclimation all birds were observed daily. Birds exhibiting abnormal behavior or physical injury were not used. Following test initiation and continuing until termination, all birds were observed at least twice daily. A record was maintained of all mortality, signs of toxicity, or abnormal behavior.

Animal Body Weights/Feed Consumption

Body weights by group were measured at initiation of the study, on Day 5, and at termination of the test on Day 8. Average estimated feed consumption was determined for each test concentration group and control group for the exposure period, Days 0-5, and for the observation period, Days 6-8. Feed consumption was measured accurately, but is presented

as an estimate due to the unavoidable wastage by the birds.

d. Statistics:

The mortality pattern in this study was not conducive to calculating the LC_{50} value. Therefore, an estimation of the LC_{50} value was made by a visual inspection of the mortality data.

12. Reported Results:

There were no mortalities in the control group. All birds were normal in appearance and behavior throughout the test period.

There were no mortalities or overt signs of toxicity at any of the concentrations tested. All birds at all concentrations were normal in appearance and behavior throughout the study. When compared with controls, no effects upon body weight or feed consumption were noted.

13. Study Authors' Conclusions/QA Measures:

Mallard dietary LC_{50} > 2248 ppm, the highest concentration tested. No observed effect concentration > 2248 ppm.

This study was conducted so as to conform with Good Laboratory Practices as published by the U.S. Environmental Protection Agency, Office of Pesticide Programs (FR 48 (230) Nov. 29, 1983, pp. 53946-53969).

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures: The procedures followed were in accordance with protocols recommended by the Guidelines. However, formulated product containing only 40% dicamba was used as test material. Therefore, the LC_{50} is adjusted to account for test substance purity. The only ingredients in the formulation used are dicamba salt and water.

b. Statistical Analysis: The LC_{50} was determined by inspection. Statistical analysis was not required.

c. Discussion/Results: With an avian dietary LC_{50} > 2248 ppm, the diglycolamine salt of dicamba may

be slightly toxic to mallard ducks on a subacute dietary basis.

d. Adequacy of Study:

1. Classification: Core.

2. Rationale: The study was scientifically sound. The LC_{50} was adjusted because the formulation tested was 40% dicamba.

3. Reparability: N/A.

15. Completion of One-Liner for Study:

One-liner form completed August 20, 1986.

16. CBI Appendix: N/A.

TABLE 1

CUMULATIVE MORTALITIES OF CONTROL MALLARDS

Concentration ppm	Number Dead/Number Exposed Day of Study 0	1	2	3	4	5	6	7	8
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
0	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10

TABLE 2

CUMULATIVE MORTALITIES OF MALLARDS

EXPOSED TO CN-11-4962 4 LB/GAL DIGLYCOLAMINE SALT OF DICAMBA FOR FIVE DAYS

Concentration ppm	Number Dead/Number Exposed Day of Study 0	1	2	3	4	5	6	7	8
562	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
1000	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
1780	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
3160	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10
5620	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10	0/10

The LC50 value was determined to be greater than 5620 ppm, the highest concentration tested.